

Medtronic 

Medtronic Inc.
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IDEA SUBMITTAL AGREEMENT
Extension of the P-8131

Gentlemen,

Please receive and evaluate my disclosure (attached) of an Idea ("Idea" includes Ideas, confidential information, patent applications and completed inventions) for:

Myocardial Infarction Detection Utilizing Coronary Sinus Flow Measurement

under the following conditions:

INVENTORSHIP

I am the originator or am rightfully representing the originator of this Idea, am of legal age and have the right to disclose this Idea to the Medtronic Inc.

PURPOSE

I am disclosing my Idea to allow Medtronic to evaluate my Idea as they deem appropriate and determine their interest in negotiating for any rights therein. I understand my Idea may be disclosed to those employees or consultants of Medtronic obligated to treat this information in confidence.

CONFIDENTIALITY

Medtronic considers itself to be a member of the general public for the purpose of receiving the disclosure of the Idea. For a period of time ending twelve (12) months from the date this Agreement is signed, Medtronic will exercise the same degree of care to maintain in confidence the Idea as they exercise to protect their own confidential information. Medtronic will not,

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PAGE 14/17 * RCVD AT 5/23/2005 4:14:37 PM [Eastern Daylight Time] * SVR:USPTO-EFXRF-1/4 * DNIS:8729306 * CSID:7635146982 * DURATION (mm-ss):04-02

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PROBLEM:

The most common dangerous development of the ischemic heart disease is the myocardial infarction. It usually develops suddenly due to the occlusion of the coronary artery by a thrombus and only emergency treatment can save the patient. The first interventional method of treatment is delivery of the thrombolytic drug dissolving the thrombus. The next choice is the percutaneous coronary angioplasty by means of the balloon catheter. Finally, surgical treatment by the aorto-coronary bypass is the final solution. Nevertheless, the prompt diagnosis and the fast therapy start are the most important for survival of the patient, whereby the minutes measured time may be critical. Accordingly, some means for fast detection of impending myocardial infarction would be very important.

SOLUTION:

An implantable device comprising an ECG analysis means as well as a coronary flow measurement means capable to recognize the impending myocardial infarction can either give an alarm to the patient or even to deliver the proper drugs therapy. An implantable device comprises a sensor measuring the blood flow velocity either in cardiac vein or coronary sinus. A computer within the implantable device calculates the integral of the blood flow waveform being proportional to the blood flow volume and stores the data developing the long-term trend diagram of the blood flow volume in the memory. Physician may evaluate the ischemic heart disease progression by means of interrogating the device by a programmer and displaying the blood flow trend. It is known from cardiac physiology that coronary arteries deliver the oxygenated blood to the cardiac muscle and that the venous blood exits the cardiac muscle through the coronary sinus. Eventual disturbance of the blood flow through the coronary sinus will be the consequence of the circulatory problem within the certain coronary artery i.e. any occlusion of the coronary artery will decrease the blood volume flowing into the cardiac muscle and consequently decrease the blood volume flowing out of the cardiac muscle. Accordingly, decrease of the blood flow volume will occur in the major acute myocardial infarction. The myocardial infarction causes also the S-T elevation within the ECG waveform. The computer of the implantable device continuously monitors the S-T segment of the ECG waveform and also collects the data for the S-T segment trend developing the long-term trend diagram of the S-T segment. Physician may evaluate the long-term S-T segment variations by means of interrogating the device by a programmer and displaying the S-T trend diagram. If suddenly either of trend curves, blood flow or S-T, shows its derivation increase

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only one trend curve. If the negative derivation increase occurs in both or in curve together with the positive derivation increase in S-T segment trend curve, that means that a myocardial infarction develops. Accordingly, implantable device will give an alarm to the patient. It may be an audible alarm or some muscle stimulating alarm as it was described in prior art. Implantable device may also have a drug delivery pump and a catheter, and it may start the thrombolytic therapy as well as a prophylactic arrhythmia therapy.

MI detection point



